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Services versus Goods Trade: A Firm-Level Comparison

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Abstract Using transaction data from Belgium, we provide a descriptive comparison of trade in goods and trade in services at the firm level. From a static perspective, we find that firms trading services are fewer and export and import smaller values than those trading goods. This is because they trade fewer products, with less countries, making fewer transactions and these gaps are only partially counterbalanced by larger transaction values. Instead, firms trading both services and goods are even rarer, but they account for a substantial share of total trade. In the time dimension, services traders experience higher entry and exit rates and a lower survival probability. However, the surviving firms grow more rapidly than those trading goods thanks to an increase in the number of transactions per product-market. Finally, we observe that firms that trade only services add also goods in their export and import basket and vice versa. This is a further important growth channel for firms in international markets.

Keywords Trade in Services · Trade in Goods · Dynamics

1 Introduction

For a long time, international trade has been solely associated to the commerce of manufactured goods. In fact, services have become increasingly traded over time and today goods and services represent two equally important components of world trade (Francois and Hoeckman, 2010). In Belgium, the number of service exporters more than doubled in less than fifteen years (Ariu and

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Mion, 2012), both exports and imports tripled and the share of services in total trade increased from 15% to 25% for exports and from 18% to 22% for imports.[1] The same figures for other European countries confirm the recent powerful growth for trade in services[2] and they raise the interest for understanding the features and dynamics of this relatively new form of trade.

In this paper, we use a very detailed dataset from the National Bank of Belgium (hereafter NBB) on export and import transactions of Belgian firms to present a descriptive comparison of static and dynamic features of trade in goods and trade in services. First, we focus on the static characteristics of trade and we analyze trade participation, trade contribution, the features of firm-level flows and the characteristics of importers and exporters. Second, we explore trade dynamics, looking at entry, exit and survival in foreign markets, and comparing firms' growth strategies during their export and import life. From a static perspective, we find that firms trading services are fewer and export and import smaller values than those trading goods. This is because they trade fewer products, with less countries, making fewer transactions and these gaps are only partially counterbalanced by larger transaction values. So, the extensive margins are the main responsible for the smaller size of service traders. Another interesting results of the static analysis comes when focusing on firms that trade both goods and services. Despite being few, (they represent only 8% of exporters and 12% of importers), they tend to be very successful in international markets and they account for more than 30% of total trade.

In the time dimension, we find that services' traders experience higher entry and exit rates and a lower survival probability. However, the surviving firms grow more rapidly than those trading goods thanks to a more important increase in the number of transactions per product-market. So, international markets tend to be riskier for services, but successful firms are able to expand more than those trading goods. At the same time, this result highlights that the expansion of firm exports in a market is likely to be more related to an intensification of the interaction with existing market-products (as in Eaton et al (2014)) than to discovering preferences in new markets (as in Araujo et al (2012), Albornoz et al (2012), Buono et al (2008) and Lawless (2009)) and to the introduction of new products within existing partner-countries (as in Freund and Pierola (2010)). Finally, we observe that new exporters and importers of services tend to add also goods in their export and import basket after the first year. At the same time, new exporters and importers of goods tend to add services. These flows grow rapidly, but even after ten years they represent only a marginal share of total exports and imports within the firm. However, their importance might not just be related to their size and they could play an important role in determining the success in foreign markets. For example, firms might strategically bundle both of them to decrease the transaction costs for customers.

[1] Our computations based on the comparison between 1995 and 2010 using Belgostat data available at www.belgostat.be.

[2] The same figures apply, for example, to Germany, Iceland and Sweden. For more details refer to Eurostat (2013).

The main contribution of this paper is to provide comparable evidence on trade in services to the literature focusing on the understanding of trade at the firm-level. Most of the existing studies focus on trade in goods,[3] but in recent years a number of papers focusing on trade in services appeared thanks to the increased availability of micro data.[4] The limit of these contributions is that they lack information on firms trading goods.[5] Therefore, any similarity drawn remains qualitative and usually related to evidence on trade in goods in different papers and countries. Moreover, little attention has been provided to the dynamics aspects of trade. This paper complements the available evidence by analyzing quantitative and dynamic aspects of the comparison between services and goods trade at the firm-level. Furthermore, our results show the importance of the transaction margin in understanding the variation of trade both across firms and over time. Finally, this paper offers new insights for including services into the theoretical literature of international trade.

The paper is organized as follows. In Section 2 we describe the data. Section 3 is devoted to the static analysis and comparison of trade in goods and trade in services while in Section 4 we consider dynamic aspects. Finally Section 5 summarizes our findings and suggests future avenues for research.

2 Data

The analysis set out in this paper benefits from three extremely rich datasets provided by the National Bank of Belgium. The first is the NBB Trade Database, which includes imports and exports of goods made by Belgian firms over the period 1995-2010. The data provided by the NBB is organized at month-year-firm-product-country level: for every month and year, we have firm-level information on the values of imports and exports by product type and by partner-country. Moreover, we have information on the number of transactions made in that month-year for the firm-country-product triple, the unit value of the good, the quantities shipped and if the information comes from the Intrastat (Intra-European) or Extrastat (Extra-European) declarations. Firms are uniquely identified via their VAT number, products are classified following the 8-digit Combined Nomenclature (CN8) while for countries we have ISO 2-digit codes. For the purpose of this paper, we focus on transactions involving a change in ownership only. In this way, we get rid of transactions referring to movement of stocks, replacement or repair of goods, processing of goods, returns and transactions without compensation.[6] Similarly to other

[3] See Bernard et al (2012) for a review.

[4] Breinlich and Criscuolo (2011) for the UK, Kelle and Kleinert (2010) for Germany, Walter and Dell'mour (2010) for Austria, Gaulier et al (2011) for France and Federico and Tosti (2012) for Italy

[5] Kelle and Kleinert (2010), Federico and Tosti (2012) do not have any information on trade in goods, Breinlich and Criscuolo (2011) has information on trade in goods only for two years and only for exports and Walter and Dell'mour (2010) Gaulier et al (2011) have information on trade in goods, but they do not exploit it.

[6] In this way we also get rid of most of the re-exporting present in the dataset.

trade data at firm-level,[7] the requirement for observing a firm-level flow is reasonably low. In particular, firms trading with extra-EU countries have to declare to the NBB any transaction exceeding 1,000 Euros and this threshold has remained stable over time. Firms trading with EU countries instead were obliged to declare their transactions only if their total exports or imports in the European Union on the previous year were above 104,115 Euros. This threshold increased to 250,000 Euros after 1998 and to 1,000,000 Euros for exports and 400,000 Euros for imports after 2006.[8]

The second piece of information is the NBB dataset on trade in services which was collected from 1995 to 2005 in order to compile the Balance of Payments (BoP). Over that period Belgian firms were obliged to declare to the NBB any service transaction above 12,500 Euros (9,000 Euros from 1995 to 2001) in which the counterpart was a foreign entity, without any difference between intra-EU and extra-EU trade. As in the case of goods, the service dataset provided by the NBB is organized at the month-year-firm-product-country level. We can track firms through their VAT code, service products are classified following the BoP classification (see Table 1), the destination or origin country is determined via ISO 2-digit codes and we have information on the value and the number of transactions made. We drop transactions referring to *"Merchanting"* and *"Services between Related Enterprises"* from this dataset because their definition in the NBB classification does not uniquely identify trade in services and includes also values of the goods involved. The definition of trade in services is based on the residence status as in the International Monetary Fund (1993) Balance of Payments Manual (5th ed.) and the data includes modes one, two and four of trade in services as defined in the General Agreement on Trade in Services (GATS).[9] However, our dataset does not distinguish among these different trade modes.

The main challenge to compare trade in goods and trade in services is represented by the differences in the cut-off thresholds. Given the enormous amount of data loss that would be induced by the exclusion of the intra-EU trade (which represents about 70% of total trade) and the fact that the thresholds refer to the overall exports or imports in the EU, we keep both intra-EU and extra-EU trade focusing on all transactions above 12,500 Euros. However, when appropriate, we will differentiate between the two and show the results separately for extra-EU and intra-EU trade. One last step to make services

[7] For example the French dataset used in Eaton et al (2011), Mayer et al (2014) and Mayer and Ottaviano (2007) among other papers.

[8] For more details on this dataset see Muûls and Pisu (2009), Behrens et al (2013), Mion and Zhu (2013) and Bernard et al (2010).

[9] The GATS defines four modes of trade in services: mode 1 (Cross-Border) is when a service is produced in one country and consumed in the territory of another country. Mode 2 (Consumption Abroad) is when the service is consumed in the territory in which it has been produced by the resident of another country. Mode 3 (Presence Abroad) is when the service is provided by a supplier through the commercial presence in the country of the consumer. Mode 4 (Presence of Natural Person) is when a supplier provides the service in another country sending one or more employees to that country. For examples refer to Ariu and Mion (2012) and Breinlich and Criscuolo (2011).

Table 1 List of Services in the Balance of Payments

Number	Name	Code	Number	Name	Code
1	**Transportation**	205	*5.4*	*Re-Insurance*	257
1.1	*Sea Transport*	206	*5.5*	*Auxiliary Services*	258
1.1.1	Passengers	207	**6**	**Financial Services**	260
1.1.2	Freight	208	**7**	**Computer and Information Services**	262
1.1.3	Other	209	*7.1*	*Computer Services*	263
1.2	*Air Transport*	210	*7.2*	*Information Services*	264
1.2.1	Passengers	211	**8**	**Royalties and License Fees**	266
1.2.2	Freight	212	**9**	**Business Services**	268
1.2.3	Other	213	*9.1*	*Merchanting and other trade-related activities*	269
1.3	*Other Transport*	214	9.1.1	Merchanting	**270**
1.3.1	Passengers	215	9.1.2	Other Trade-Related Activities	271
1.3.2	Freight	216	*9.2*	*Operational Leasing Services*	272
1.3.3	Other	217	*9.3*	*Miscellaneous Business, Professional and Technical Activities*	273
2	**Travel**	236	9.3.1	Legal, Accounting, Management, Consulting and Public Relations	274
2.1	*Business Travel*	237	9.3.2	Advertising, Market Research, and Public Opinion Polling	278
2.2	*Personal Travel*	240	9.3.3	Research and Development	279
2.2.1	Health-related	241	9.3.4	Architectural, Engineering and Other Technical Services	280
2.2.2	Education-related	242	9.3.5	Agricultural, Mining, and Other On-Site Processing Services	281
2.2.3	Other	243	9.3.5.1	Waste Treatment and De-pollution	282
3	**Communication Services**	245	9.3.5.2	Agricultural, Mining, and Other On-Site Processing Services	283
3.1	*Postal and courier services*	246	9.3.6	Other Business Services	284
3.2	*Telecommunication services*	247	9.3.7	Services between Related Enterprises	**285**
4	**Construction Services**	249	**10**	**Personal, Cultural and Recreational Activities**	287
5	**Insurance Services**	253	*10.1*	*Audiovisual and Related Services*	288
5.1	*Life Insurance and Pension Funding*	254	*10.1*	*Other Personal, Cultural and Recreational Activities*	289
5.2	*Freight Insurance*	255	**11**	**Governmental Services**	291
5.3	*Other Direct Insurance*	256			

Note: List of Services present in the Balance of Payments. We exclude "Merchanting" (code 270, in bold) and "Services between Related Enterprises" (code 285, in bold) because they can not genuinely be considered as trade in services in the NBB dataset.

and goods trade comparable is to use the CN goods product classification at 2-digit level (CN2). In this way, the definition of what is a goods product using the CN2 classification is as narrow as the definition of a service product in the BoP classification.[10] In order to keep the dimension of the dataset manageable and avoid any seasonality issue, we collapse the data at the firm-year level. Therefore, for any given firm-year we know for both services and goods trade the export (import) values, the number of products or services exported (imported), the number of export (import) partner-countries and the number of export (import) transactions made. Finally, we attach to this dataset balance-sheet information on Belgian firms over the period 1995-2005 coming from the Business Registry covering the population of firms required to file their (unconsolidated) accounts to the NBB. For any firm-year, we get information on firms' main sector at NACE 5-digit level, the foundation year and annual accounts figures such as employment, turnover, value added, physical capital, intangible capital and wage. The resulting dataset includes all firms registered in Belgium having limited liability which means around 200,000-300,000 firms per year, for a total of about 3 million observations over our time frame. When compared to most of the firm-level datasets used in the literature, this is particularly good in terms of coverage, since we have almost every firm operating in Belgium and a long time span. Moreover, this is the only available dataset with information on transactions' values and number for both goods and services and both for imports and exports.[11]

[10] Using this rule, we count 90 goods products and 49 service products. Using the more disaggregate 4-digit CN classification results remain unchanged.

[11] The novelty of using transaction data raises the need for clarification on precisely what a transaction is in our datasets. In general, in this paper, a transaction is defined as the registration by the NBB of a credit (export) or a debt (import), above 12,500 Euros, between

3 Static Analysis

In this section we provide a comparison of static features of trade in goods and trade in services at the micro level. The Belgian data allow us to properly contrast these two types of trade so enriching the existing qualitative comparisons with quantitative insights. In the spirit of the previous literature describing trade at firm level, we focus our attention on trade participation and trade contribution, the characteristics of firm-level flows and those of importers and exporters.

3.1 Trade Participation and Contribution

We start our static analysis by looking at the participation of firms in export and import activities separately. In this way, we can distinguish in Table 2, Panel a, firms that export only goods (*Goods Exporters*), those that export only services (*Service Exporters*), those that export both (*Bi-Exporters*) and those that do not export at all (*Non-Exporters*). Panel b presents the same type of classification for imports.

The first important result that emerges from Table 2 is that trade in services is rarer than trade in goods. Out of the 9% of firms that achieve to export, only 29% export services and only 17% of the 10% of firms that import source services. When considering that more than 70% of domestic production is represented by services (Duprez, 2011) and about 80% of firms belong to the services sector, the low participation of firms in trade in services becomes even more impressive. Several factors can explain why trading services in foreign countries is rarer than trading goods: fixed costs, variable costs and the intrinsic lower tradability of services. Higher fixed costs of exporting and importing services would imply a more severe selection process allowing fewer firms to enter the export and import market, making service trading more elitist than trade in goods. Examples of these fixed costs can be the acquisition of special certifications, the inscription to particular registers or market restrictions (as

a Belgian firm and a foreign firm, arising from the transfer of ownership of a good in the case of trade in goods and the provision of a service in the case of trade in services. More specifically, both for goods and services the collection system is declaration-based, and for trade in goods is represented by the declaration of an outgoing (export) or an incoming (import) shipment of products made to the Belgian Customs Authority (that passes on the information to the NBB). For trade in services, a transaction is defined by a declaration made to the NBB about the collection of a credit (export) or the solvency of a debt (import) related to the provision of a service. This can be direct, when the Belgian firm makes the declaration directly to the NBB, or indirect, when the declaration is made by the financial institution that is involved in the execution of the transaction. The NBB defines the list of companies that should declare directly, for the other firms not on the list, the financial institution involved in the transaction collects and sends the information to the NBB. The fact that the NBB is charged to decide the information to be put on both declarations and to the physical collection of the data guarantees the comparability of the transactions across goods and services. In the rest of the paper we will refer to the number of transactions or equivalently to the frequency of trade as the number of transactions performed by a firm over one year.

Table 2 Trade Participation and Contribution, Export and Import Separately

Complete Sample	**Panel a: Exports**						**Panel b: Imports**				
	Services		Goods		Non-Exporters		Services		Goods		Non-Importers
	Bi-Exporters						Bi-Importers				
Share of firms	2.68%	0.63%		5.68%	91.01%	Share of Firms	1.71%	1.16%		7.17%	89.96%
Share of Exporters	29.08%	7.79%		63.14%		Share of Importers	17.06%	11.52%		71.42%	
Share of Exports	7.28%	4.16%	28.89%	59.67%		Share of Imports	5.61%	6.47%	43.58%	44.33%	
Number of firm-years	81,733	19,122		173,106	2,773,344	Number of firm-years	52,232	35,253		218,602	2,741,218
Non-EU											
	Services		Goods		Non-Exporters		Services		Goods		Non-Importers
	Bi-Exporters						Bi-Importers				
Share of firms	0.77%	0.21%		3.18%	95.84%	Share of Firms	0.67%	0.36%		3.21%	95.75%
Share of Exporters	18.41%	5.09%		76.50%		Share of Importers	15.78%	8.55%		75.67%	
Share of Exports	8.19%	4.85%	25.14%	61.83%		Share of Imports	6.16%	5.89%	37.44%	49.18%	
Number of firm-years	23,327	6,447		96,910	2,920,621	Number of firm-years	20,417	11,065		97,920	2,917,903
EU											
	Services		Goods		Non-Exporters		Services		Goods		Non-Importers
	Bi-Exporters						Bi-Importers				
Share of firms	2.64%	0.43%		4.44%	92.49%	Share of Firms	1.65%	0.93%		6.05%	91.38%
Share of Exporters	35.18%	5.70%		59.13%		Share of Importers	19.11%	10.74%		70.15%	
Share of Exports	8.41%	2.49%	24.51%	64.59%		Share of Imports	6.53%	5.53%	40.23%	47.71%	
Number of firm-years	78,559	12,718		132,035	2,749,763	Number of firm-years	48,970	27,526		179,739	2,716,840

Note: this table represents separately for exports (Panel a) and Imports (Panel b) and for each category of firm (firms exporting (importing) only services, both services and goods (Bi-Exporters or Bi-Importers), only goods and for Non-Exporters (Non-Importers)) 1) the share of firms with respect to the total number of firms 2) the share of exporters or importers with respect to the total number of exporters or importers and 3) the share of total exports or imports. The unit of observation is a firm-year.

in the case of telecommunications). Higher variable costs might be related, for instance, to the impediments of freely moving people due to visa requirements (which can require money and time) or the obligation to follow specific schemes imposed by professional associations. The lower tradability of services instead relates to the specific nature of some services which makes them hardly tradable. One example is represented by government services, which are meant to serve the local population. At the same time, also hairdressers and janitorial services are difficult to trade because they imply either the foreign customers or producers to reach the other party.[12] By differentiating across intra-EU and extra-EU trade, it is clear that the participation to export and import activities is more important in the former. Intra-EU exporters account for 7.5% of the total amount of firms in Belgium, while extra-EU exporters make only 4%. Most of the drop is caused by a decrease in the number of service exporters and importers. Besides the fact that distance, language and cultural affinity might play a more important role for trade in services outside the EU, the restrictions to the movement of people might also represent a further important hurdle. In terms of trade contribution, services importers and exporters represent only 20% of total exports and imports. So, they are not only fewer, but also smaller.

The second important result of Table 2 is that 7.79% of exporters and 11.52% of importers trade both goods and services. Even if very few (they represent respectively only 0.64% and 1.16% of all firms in Belgium), they account for more than 30% of total exports and more than 50% of total imports. Therefore, these Bi-Exporters and Bi-Importers make a disproportionally high contribution to total trade relative to their small number. By distinguishing across goods and services trade, we can see that most of the contribution is in the former category: the Bi-Exporters account for 28,89% of goods and 4.16% of services exports and Bi-Importers account for 43.58% of goods and 6.47% of services imports. These numbers rise questions on the determinants of the

[12] While it is easy if both are close to the border, the cost of reaching one the other can become very high when the distance to the border increases.

Table 3 Trade Participation and Contribution by Sector

	Exports				Imports			
	Services	Goods		Non-	Services	Goods		Non-
Panel a: Share of Firms	Bi-Exporters			Exporters	Bi-Importers			Importers
Agricultural and Mining	0.77%	0.53%	5.94%	92.75%	0.57%	0.65%	4.48%	94.30%
Manufacturing	0.95%	1.86%	19.40%	77.79%	0.75%	4.83%	17.59%	76.83%
Services	2.49%	0.50%	3.58%	93.43%	1.49%	0.79%	5.31%	92.40%
Panel b: Share of Exporters								
Agricultural and Mining	10.64%	7.36%	82.00%		10.04%	11.46%	78.51%	
Manufacturing	4.26%	8.38%	87.36%		3.23%	20.86%	75.91%	
Services	37.92%	7.60%	54.48%		19.65%	10.46%	69.89%	
Panel c: Share of Exports								
Agricultural and Mining	0.93%	1.45%	15.92%	81.70%	1.29%	5.39%	30.09%	63.23%
Manufacturing	0.19%	1.66%	45.21%	52.94%	0.21%	5.08%	69.09%	25.62%
Services	20.40%	10.26%	24.07%	45.28%	10.06%	9.83%	44.05%	36.06%

Note: This Table presents for each sector the share of firms (Panel a), the share of exporters (Panel b) and the share of exports (Panel c) for Exports and Imports.

choice to trade services and goods together and they seem to suggest that only the biggest exporters and importers achieve to supply both of them in international markets.

By differentiating across sectors in Table 3, we can appreciate that export and import participation is higher in the manufacturing sector (more than 20% of firms export or import) than in the agricultural and mining and services sectors (about 7% in both). At the same time, firms trading goods represent the majority of exporters and importers in all sectors: respectively 54.48% and 69.89% in the service sector, 87.36% and 75.91% in the manufacturing sector and 82.00% and 78.51% in the agricultural and mining sector. Instead, firms trading services are mostly concentrated in the services sector (they represent 37.92 of exporters and 19.65% of importers) and only few are present in the manufacturing and agricultural and mining sectors. Firms trading both goods and services are more homogeneously distributed across sectors accounting for more than 7% of exporters and between 10% and 20% of importers. Their contribution to total exports and imports of manufactured products is particularly significant in the manufacturing sector, where they account for 45.21% of exports and 69.09% of imports. Instead, their contribution to service trade is more important in the services sector, with 20.40% of exports and 10.06% of imports.

3.2 The Anatomy of Firm Flows

In this subsection, we disentangle the different components of firm-level flows and we analyze why service exporters and importers contribute less to total trade than goods traders. We consider trade margins in the same spirit of Bernard et al (2009) and decompose, separately for goods and services, exports (Exp_{ft}) and imports (Imp_{ft}) made by firm f at time t into the product of the number of products p_{ft}, number of countries c_{ft}, density d_{ft}, number of transactions tr_{ft} and average transaction value $\bar{x}_{ft}$. Analytically:

$$Exp_{ft} = p_{ft} * c_{ft} * d_{ft} * tr_{ft} * \bar{x}_{ft} \qquad Imp_{ft} = p_{ft} * c_{ft} * d_{ft} * tr_{ft} * \bar{x}_{ft}, \quad (1)$$

where the density, d_{ft} is computed by counting the number of country-product pairs effectively served by the firm over the total possible amount ($p_{ft} * c_{ft}$)

and $\bar{x}_{ft}$ is defined as firm exports (imports) value over the product between the number of country-product pairs effectively served and the number of transactions made by firm f at time t. With this decomposition, we have four extensive margins (number of transactions, number of markets, number of products and density) and one intensive margin (the average transaction value per market and product effectively served). This very disaggregated decomposition can be flexibly aggregated to compute, for example, the number of transactions and the average transaction size, or the number of country-product effectively served and the average exports (imports) per product-country served by simply multiplying the involved components of the decomposition.[13]

In Table 4 we show the average value of each component of the decomposition for the 1^{st}, 10^{th}, 50^{th}, 75^{th} and 99^{th} centiles of the distribution of exporters and importers.[14] As also noted before, firms trading services are on average smaller than those trading goods. The extensive margins play a major role in this difference: firms exporting or importing goods supply more products in more destinations and make many more transactions. Services' traders instead have less geographically widespread exports and imports, fewer products and use fewer transactions. However, the transaction value is larger for services than for goods. These findings are less acute for the small exporters and importers, but they diverge significantly for the top traders. Moreover, the results are very similar across firms (looking at firms that export or import only services or goods) and within firms (looking at Bi-Exporters and Bi-Importers).

The difference in the number of transactions made and in the transaction values constitute the distinguishing traits of goods and services. On the one hand, these can arise from the different nature of services and goods. Manufactured products can be easily delivered in chunks via different shipments, so, transaction values tend to be small while the number of transactions tends to be large. Services instead represent a continuous flow, so transaction values tend to be large and the number of transactions small. On the other hand, these results can arise from higher administrative trade barriers for services. According to the evidence of Hornok and Koren (2015), when the per-transaction cost increases, firms tend to bundle different transactions together and decrease their frequency. For goods these costs refer to the time and cost of proceeding customs declaration, or having the shipment inspected by custom agents. In the context of trade in services instead, these could be related to the time and cost to get a visa or an administrative authorization (for example in the case of construction or architectural services).

A complementary way to understand the importance of the extensive and intensive margins is to quantify their contribution in the export and import variation across firms. We follow Bernard et al (2009), we separately regress via OLS the logarithm of each margin defined in equation (1) against the

[13] For example, the average transaction size is given by: $p_{ft} * c_{ft} * d_{ft} * \bar{x}_{ft}$.

[14] Please note that using the averages for each category of exporters and importers entails that the product of all the components of the decomposition does not equal to the total exports or imports.

Table 4 Trade Margins and Trade Status

	Exports				Imports			
	Services		Goods		Services		Goods	
Centiles		Bi-Exporters				Bi-Importers		
				Panel a: Firms' Exports and Imports				
1	0.0130	0.0137	0.0135	0.0131	0.0130	0.0133	0.0147	0.0131
10	0.0209	0.0291	0.0342	0.0260	0.0216	0.0271	0.1051	0.0298
25	0.0381	0.0524	0.1497	0.0990	0.0381	0.0484	0.4996	0.1008
50	0.1120	0.1800	0.8684	0.4789	0.1073	0.1540	2.2995	0.3622
75	0.4978	0.9435	5.3409	2.1560	0.4446	0.6363	9.6802	1.2103
90	2.1389	4.9591	31.8416	9.0509	1.9501	2.7633	32.9001	3.9224
99	23.5894	72.6190	545.1865	97.7271	28.1084	54.1946	294.5829	43.3575
Average	1.7588	4.2943	29.8445	6.8091	1.9476	3.3241	22.3992	3.6744
				Panel b: Transaction Size				
1	0.0031	0.0026	0.0003	0.0006	0.0024	0.0024	0.0005	0.0008
10	0.0091	0.0083	0.0015	0.0025	0.0081	0.0068	0.0016	0.0028
25	0.0152	0.0156	0.0043	0.0058	0.0148	0.0131	0.0032	0.0054
50	0.0276	0.0306	0.0119	0.0134	0.0275	0.0248	0.0074	0.0114
75	0.0496	0.0600	0.0275	0.0266	0.0500	0.0451	0.0191	0.0224
90	0.1008	0.1423	0.0665	0.0585	0.1093	0.0939	0.0490	0.0485
99	0.5461	0.9842	0.3996	0.3532	0.5827	0.5000	0.4404	0.3711
Average	0.0622	0.0864	0.0424	0.0368	0.0627	0.0535	0.0445	0.0377
				Panel c: Number of Transactions				
1	1	1	1	1	1	1	1	1
10	1	1	1	1	1	1	3	2
25	1	1	4	4	1	1	12	4
50	2	3	18	13	2	3	45	12
75	8	11	79	41	7	10	149	33
90	23	36	391	133	21	28	434	83
99	157	261	6088	1288	170	239	2884	581
Average	12	19	308	92	12	17	234	50
				Panel d: Number of Countries				
1	1	1	1	1	1	1	1	1
10	1	1	1	1	1	1	1	1
25	1	1	1	1	1	1	2	1
50	1	1	3	2	1	1	4	2
75	2	3	8	5	2	3	7	3
90	5	6	21	10	5	6	12	6
99	14	19	84	40	17	21	26	13
Average	2	3	8	5	2	3	6	3
				Panel e: Number of Services				
1	1	1	1	1	1	1	1	1
10	1	1	1	1	1	1	1	1
25	1	1	1	1	1	1	1	1
50	1	1	1	1	1	1	3	1
75	1	1	3	2	2	2	6	3
90	2	2	5	3	2	4	10	4
99	4	6	14	9	5	10	23	12
Average	1	1	2	2	1	2	5	2
				Panel f: Density				
1	0.4	0.3	0.2	0.2	0.3	0.2	0.2	0.2
10	0.7	0.5	0.3	0.5	0.5	0.4	0.2	0.4
25	1.0	1.0	0.5	0.8	1.0	0.5	0.3	0.5
50	1.0	1.0	1.0	1.0	1.0	1.0	0.5	1.0
75	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
90	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
99	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Average	0.9	0.9	0.8	0.9	0.9	0.8	0.6	0.8

Note: This table reports the decomposition of firm flows outlined in equation 1 for firms exporting (importing) only services, both services and goods (Bi-Exporters or Bi-Importers) and only goods.

logarithm of firm-level trade flows as well as industry-year fixed effects. Each regression provides a coefficient representing the contribution of each margin to the across-firms variation in export and import values.[15] Indeed, more than 60% of the total variation in export and import flows across firms is accounted by the transaction frequency (Table 5). Therefore, the number of transactions

[15] Please note that the coefficients add up to one thanks to the linearity of OLS, so, each coefficient represents the share of total variation explained by the considered margin.

Table 5 OLS Trade Decomposition

	Panel a: Exports				**Panel b: Imports**			
	Services		Goods		Services		Goods	
		Bi-Exporters				Bi-Importers		
Product	0.0721***	0.1054***	0.1603***	0.1154***	0.1278***	0.2199***	0.2378***	0.1909***
	(0.001)	(0.002)	(0.002)	(0.001)	(0.001)	(0.002)	(0.002)	(0.001)
Country	0.2645***	0.2856***	0.3646***	0.3207***	0.2939***	0.3208***	0.2785***	0.2526***
	(0.001)	(0.003)	(0.002)	(0.001)	(0.002)	(0.002)	(0.002)	(0.001)
Density	-0.0461***	-0.0712***	-0.1099***	-0.0766***	-0.0809***	-0.1441***	-0.1361***	-0.1051***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Trans. #	0.6493***	0.6223***	0.7419***	0.7201***	0.6512***	0.6724***	0.7165***	0.7230***
	(0.002)	(0.003)	(0.003)	(0.001)	(0.002)	(0.002)	(0.003)	(0.001)
Trans. Size	0.0603***	0.0578***	-0.1569***	-0.0795***	0.0081**	-0.0690***	-0.0968***	-0.0614***
	(0.003)	(0.005)	(0.005)	(0.002)	(0.004)	(0.004)	(0.004)	(0.002)
Observations	65,934	17,659	17,659	143,171	40,023	32,728	32,728	181,550

Note: Robust Standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1. Every coefficient comes from a different regression in which every logged margin defined in eq. (1) is regressed against logged firm exports (Panel a) or firm imports (Panel b) together with industry-year dummies.

is the biggest source of variation across firm-level flows. This means that big exporters (importers) differ from small ones mainly because of a difference in the number of transactions they make over a year. The contribution to the total variation looks very similar for goods and services, with big exporters trading more products, in more partner countries, making more transactions and having a smaller density than small traders. However, there is a noticeable difference in terms of transaction size.[16] While big traders of goods tend to make smaller transactions than small goods traders, the opposite holds for services. Again, this can be related to higher per-transaction costs for services that might lead service traders to group transactions together as the total value of exports or imports increases. In terms of classic static trade models featuring firm heterogeneity and trade costs, like Melitz (2003) and Bernard et al (2011) among others, such differences are of little relevance.[17] Instead, these findings can be useful for models rationalizing the optimal choice of firms in terms of frequency and size of shipments, such as Hornok and Koren (2015) and Alessandria et al (2010), for differentiating across goods and services.

3.3 Firms Characteristics

In this section we explore whether differences in participation and size of firm-level flows might be related to differences in terms of standard observables such as employment, turnover, labor productivity, average wages, capital intensity, foreign ownership, multinational status and age.[18] We follow the strategy of Bernard and Jensen (1999) and regress these firm-level characteristics against

[16] Except for service Bi-Importers.

[17] This is because they analyze export participation at the firm-product-country dimension without entering into the debate involving the organization of exports and imports in terms of shipment size and frequency.

[18] Employment is in full-time equivalents, average wage is computed as total wage bill over the number of workers, capital intensity is computed as total physical assets over the number of workers, multinational and foreign ownership status are dummies indicating whether a firm has an affiliate abroad or more than 50% of the company is in the hands of foreign investors.

Table 6 Firm Characteristics by Trade Status

	(1) Employment	(2) Turnover	(3) Labor Productivity	(4) Wages	(5) Capital Intensity	(6) Age	(7) Multinational Status	(8) Foreign Ownership
Panel a: Exports								
Bi-Exporters	2.3856***	3.9325***	0.4797***	0.5324***	-0.0077	0.1039***	0.1673***	0.5729***
	(0.014)	(0.015)	(0.006)	(0.004)	(0.012)	(0.002)	(0.003)	(0.006)
Service Exporters	1.4162***	2.2093***	0.2813***	0.4423***	-0.3754***	0.0227***	0.0434***	0.3351***
	(0.008)	(0.008)	(0.004)	(0.003)	(0.009)	(0.001)	(0.001)	(0.004)
Goods Exporters	1.3146***	2.6083***	0.2927***	0.2814***	0.0184***	0.0227***	0.0401***	0.3598***
	(0.005)	(0.005)	(0.002)	(0.002)	(0.005)	(0.000)	(0.001)	(0.002)
Constant	0.8546***	-1.7264***	-3.0504***	-3.6978***	-3.6643***	0.0018***	0.0032***	2.0777***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.000)	(0.000)	(0.001)
Observations	1,386,471	2,053,839	1,348,137	1,384,905	1,346,148	2,842,011	2,842,011	2,806,572
R-squared	0.2116	0.2793	0.1294	0.1425	0.0877	0.0349	0.0617	0.0784
Panel b: Imports								
Bi-Importers	2.7422***	4.3119***	0.4885***	0.5586***	0.0170*	0.1124***	0.2012***	0.6034***
	(0.009)	(0.010)	(0.004)	(0.003)	(0.009)	(0.002)	(0.002)	(0.005)
Service Importers	1.5783***	2.7032***	0.3165***	0.5051***	-0.5112***	0.0369***	0.0747***	0.3777***
	(0.009)	(0.011)	(0.005)	(0.003)	(0.011)	(0.001)	(0.001)	(0.005)
Goods Importers	1.2589***	2.4026***	0.2324***	0.2898***	-0.0146***	0.0102***	0.0202***	0.3915***
	(0.004)	(0.004)	(0.002)	(0.001)	(0.005)	(0.000)	(0.000)	(0.002)
Constant	0.8084***	-1.7689***	-3.0536***	-3.7079***	-3.6635***	0.0017***	0.0026***	2.0698***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.000)	(0.000)	(0.001)
Observations	1,386,471	2,053,839	1,348,137	1,384,905	1,346,148	2,842,011	2,842,011	2,806,572
R-squared	0.2436	0.3095	0.1293	0.1491	0.0879	0.0500	0.0968	0.0824

Note: Robust Standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1. Every column represent a different regression in which the dependent variable is one of the seven firm characteristics (Employment, Labor Productivity, Average Wage, Average Capital, Intangible Capital and Age) and the independent variables are the dummies identifying firms exporting only services (Service Exporters), firms exporting only goods (Goods Exporters) and firms exporting both (Bi-Exporters) in Panel a. In Panel b instead the independent variables represent firms that only import services (Service Importers), firms that import only goods (Goods Importers) and firms importing both (Bi-Importers). All regressions include industry-year dummies.

dummies identifying the different categories of traders along with industry-year dummies. Far from capturing a causal link, this type of analysis is simply meant to provide descriptive evidence. We build on the same categories used in Table 2 and provide estimations of dummies indicating firms that export (import) only goods, only services, or both services and goods. The reference category in our analysis is represented by firms that do not export (import) at all.

Table 6 reports our results; Panel a for exports and Panel b for imports. On the one hand, Bi-Exporters and Bi-Importers display higher premia with respect to both non-Exporters and non-Importers and both service and goods traders. This means that Bi-Exporters and Bi-Importers are bigger, more productive, older than any other firm in the economy. Moreover, they tend to pay higher wages and they are more likely to be foreign owned and to have foreign affiliates. On the other hand, services exporters and importers display premia which are very similar to those of goods traders. So, firms trading only services and those trading only goods look pretty similar in terms of employment, turnover, labor productivity, average wages, capital intensity, age, foreign ownership and multinational status. This is a quite interesting result, because it suggests that all the differences in terms of participation, contribution and features of firm-level flows between services and goods should not be related to the fact that service and goods traders represent different types of firms. Moreover, these results rationalize and further disentangle the findings of Breinlich and Criscuolo (2011) about the differences across service and goods traders.

3.4 Considerations on the Static Analysis

Several key insights arise from the static analysis. First, the participation of firms to international trade is rarer for services than for goods. Different factors can play a role in this dimension: fixed costs, variable costs, the lower tradability of services or the fact that services represent a relatively new form of trade. Second, firm-level flows are smaller for services than for goods. The extensive margins account for most of the difference: service flows are less geographically widespread and they embed fewer products and transactions. The intensive margin partially counterbalances this and the transaction size per destination and product is higher for services than for goods. This difference in the organization of transactions size and number can arise both from the intangible nature of services and from higher per-transaction costs for services. Third, firms trading both services and goods are even rarer than firms trading only one of them, however, they contribute substantially to total exports and imports.

It is important to highlight that all these differences are not related to firm-level characteristics. Both goods and service exporters and importers show to be similar in terms of employment, turnover, labor productivity, average wages, capital intensity, intangible capital intensity and age. Moreover, the findings remain constant both across firms (when looking at firms that export or import only services or goods) and within firms (when looking at firms that export or import both goods and services). In summary, the findings of the static analysis do not claim for new theoretical contributions. Most of the classic models focus on the decision to export considering the country and product dimension neglecting the transaction dimension.[19] However, the differences highlighted in this section can provide indications for distinguishing across goods and services to the models rationalizing the optimal choice of firms in terms of frequency and size of transactions, such as Hornok and Koren (2015) and Alessandria et al (2010).

4 Dynamic Analysis

Having analyzed the static characteristics of trade in goods and trade in services, we switch in this paragraph to the analysis of dynamic aspects, highlighting similarities and differences across services and goods trade. The goal is to understand how firms start exporting and importing and how they grow and expand in foreign markets. Accordingly, we analyze first entry, exit and survival in foreign markets and then firms' growth strategies.

[19] For example Melitz (2003) and Bernard et al (2011).

Table 7 Entry and Exit

Panel a: Exports								
	Services				**Goods**			
	Entrants	**Survivors**	**Exiters**	**Exit by Entrants**	**Entrants**	**Survivors**	**Exiters**	**Exit by Entrants**
All	43%	57%	13%	64%	21%	79%	7%	48%
EU	48%	52%	10%	67%	24%	76%	6%	49%
Non-EU	43%	57%	36%	66%	31%	69%	27%	59%
Agric. & Mining	70%	30%	18%	74%	24%	76%	4%	52%
Manufacturing	53%	47%	30%	71%	19%	81%	4%	46%
Services	45%	55%	9%	66%	30%	70%	9%	55%
Panel b: Imports								
	Services				**Goods**			
	Entrants	**Survivors**	**Exiters**	**Exit by Entrants**	**Entrants**	**Survivors**	**Exiters**	**Exit by Entrants**
All	41%	59%	31%	66%	17%	83%	14%	43%
EU	46%	54%	17%	65%	23%	77%	3%	42%
Non-EU	42%	58%	35%	65%	28%	72%	24%	56%
Agric. & Mining	57%	43%	21%	63%	30%	70%	8%	44%
Manufacturing	38%	62%	22%	63%	19%	81%	4%	42%
Services	44%	56%	17%	65%	24%	76%	4%	51%

Note: This table reports: i) the average share of new exporters or importers over the total number of exporters or importers; ii) the share of firms that were already exporting (importing) the previous year; iii) the share of firms that will not export (import) the following year; iv) the share of entrants in the overall number of firms that will not export (import) the following year.

4.1 Entry, Exit, and Survival in Foreign Markets

How many new exporters and importers do we observe every year? Table 7 shows that on average 43% of service exporters and 41% of service importers are firms that were not trading in the previous year. For trade in goods the share of new traders is lower: 21% for exports and 17% for imports. Similarly, by looking at the number of firms that stop exporting or importing, we observe that also exit rates are higher for services: 13% against 7% for exports and 31% against 14% for imports. So, service trade shows a higher turnover than trade in goods. For both of them, the share of entrant firms is larger than the share of exiting ones, thus leading to a net increase in the number of trading firms over time.[20] By distinguishing across EU and non-EU trade, figures remain very similar, except that exit rates tend to be higher in non-EU destinations. Results remain very similar also when looking at different industries: entry and exit rates tend to be higher for services and the share of survivors is higher for trade in goods for all sectors. The only small difference is that we observe entry rates to be a bit higher in the agricultural and mining sector for both exports and imports.

How do these new firms enter in foreign markets? In Table 8, we differentiate across firms that trade only goods or services and those that trade both. We find that more than half of entrant firms trade only goods (53% of exporters and 66% of importers), the rest trades only services (43% for exports and 29% for imports) or both (3% for exports and 5% for imports). In terms of trade contribution, these new traders account for less than 9% of total exports and imports in the same year. So, their contribution to total trade

[20] Taking into account re-entries (firms that stop exporting/importing for one year and then restart trading the year after) as well as firms that bounce around the cut-off threshold slightly lowers entry and exit shares in Table 7 while not changing the magnitude of the difference between goods and services trade.

Table 8 Entrants Features

	Panel a: Exports				Panel b: Imports			
	Services		Goods		Services		Goods	
		Bi-Exporters				Bi-Importers		
Share of Entrants	42.77%	3.39%		53.84%	28.73%	5.18%		66.09%
Share of Entrants' Exports	8.08%	3.09%	25.46%	63.36%	6.48%	4.74%	33.41%	45.73%
Share of Tot. Exports	0.70%	0.27%	2.21%	5.50%	0.50%	0.41%	2.90%	3.97%
Average Trans. Size	0.0637	0.0927	0.0647	0.0451	0.0694	0.0645	0.0570	0.0501
Average Trans. #	3	7	184	32	3	9	159	25
Average Product #	1	2	2	1	1	2	4	2
Average Destination #	1	2	6	2	1	2	4	2
Average Density	0.9741	0.9197	0.8248	0.9327	0.958	0.8573	0.69631	0.8931

Note: this table shows for firms starting exporting (importing) only services, both services and goods (Bi-Exporters or Bi-Importers) and only goods i) the share of new firms ii) their contribution to exports (imports) of new entrants; iii) their share in overall exports (imports) iv) the average value of the extensive and intensive margins of their flows. Panel a for exports and Panel b for imports.

is rather small despite their number. Similarly to the static analysis, 90% of trade created by the new exporters and importers is represented by trade in goods and trade in services accounts only for about 10%. The extensive margin is again the main responsible for the smaller size of service exporters and importers: they trade with less partner-countries, products and transactions than exporters and importers of goods. The intensive margin is instead bigger for service traders than goods traders, but the larger transaction size does not compensate for the extensive margin gap. One further important element that can play a role in the difference across goods and service entrants is whether they represent different types of firms. We apply the same strategy as in the previous section and regress the same firm-level characteristics on dummies representing the different types of exporters and importers. Results in Table 9 highlight that new exporters and importers are bigger, more productive, older, pay higher wages and are more likely to be foreign owned or multinationals than domestic firms. However, differences across traders are small and only Bi-Exporters and Bi-Importers tend to have higher premia than firms trading only goods or services. So, new exporters and importers of services are not too dissimilar with respect to the new exporters and importers of goods.

Replicating the same analysis for the firms that stop exporting or importing reveals that their composition is similar to those of new exporters and importers. Most of firms that exit foreign markets trade goods: about 57% for exports and 60% for imports. Some trade services: 41% for exports and 33% for imports (Table 10). Only a tiny minority trades both: 2% for exports and about 6% for imports. The big difference with respect to the entrants firms is that in the year before exiting, these firms account only for about 1% of total exports and imports. So, they trade significantly less than the new traders before exiting. By dividing trade into its margins, differences across different types of exporters and importers remain more or less the same as for entrants. Goods importers and exporters that exit tend to trade with more partner-countries, more products, with more transactions but with a smaller transaction size. Moreover, by checking their firm-level characteristics in Table 11, we can see that most of exiting traders are different from domestic firms in the same way as entrants. Overall, the only noticeable difference with respect

Table 9 Firm Characteristics of New Exporters and Importers

	(1) Employment	(2) Turnover	(3) Labor Productivity	(4) Wages	(5) Capital Intensity	(6) Age	(7) Multinational Status	(8) Foreign Ownership
Panel a: Exports								
Bi-Exporters	1.9756***	2.5782***	0.5342***	0.5457***	0.1623***	0.0123***	0.0257***	0.2995***
	(0.037)	(0.048)	(0.017)	(0.011)	(0.031)	(0.002)	(0.003)	(0.021)
Service Exporters	1.0209***	1.5644***	0.2419***	0.3576***	-0.2410***	0.0113***	0.0186***	0.1227***
	(0.011)	(0.011)	(0.006)	(0.004)	(0.013)	(0.001)	(0.001)	(0.005)
Goods Exporers	0.9042***	1.7245***	0.2595***	0.2516***	0.0789***	0.0022***	0.0082***	0.0927***
	(0.008)	(0.010)	(0.005)	(0.003)	(0.009)	(0.000)	(0.001)	(0.005)
Constant	0.8382***	-1.7474***	-3.0576***	-3.7080***	-3.6651***	0.0017***	0.0029***	2.0710***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.000)	(0.000)	(0.001)
Observations	1,250,882	1,898,998	1,215,132	1,249,317	1,212,669	2,684,738	2,684,738	2,650,291
R-squared	0.0986	0.1236	0.1166	0.1000	0.0891	0.0056	0.0115	0.0604
Panel b: Imports								
Bi-Importers	2.7422***	4.3119***	0.4885***	0.5586***	0.0170*	0.1124***	0.2012***	0.6034***
	(0.009)	(0.010)	(0.004)	(0.003)	(0.009)	(0.002)	(0.002)	(0.005)
Service Importers	1.5783***	2.7032***	0.3165***	0.5051***	-0.5112***	0.0369***	0.0747***	0.3777***
	(0.009)	(0.011)	(0.005)	(0.003)	(0.011)	(0.001)	(0.001)	(0.005)
Goods Importers	1.2589***	2.4026***	0.2324***	0.2898***	-0.0146***	0.0102***	0.0202***	0.3915***
	(0.004)	(0.004)	(0.002)	(0.001)	(0.005)	(0.000)	(0.000)	(0.002)
Constant	0.8084***	-1.7689***	-3.0536***	-3.7079***	-3.6635***	0.0017***	0.0026***	2.0698***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.000)	(0.000)	(0.001)
Observations	1,386,471	2,053,839	1,348,137	1,384,905	1,346,148	2,842,011	2,842,011	2,806,572
R-squared	0.2436	0.3095	0.1293	0.1491	0.0879	0.0500	0.0968	0.0824

Note: robust Standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1. Every column represent a different regression in which the dependent variable is one of the seven firm characteristics (Employment, Labor Productivity, Average Wage, Average Capital, Intangible Capital and Age) and the independent variables are the dummies identifying new traders exporting only services (Service Exporters), only goods (Goods Exporters) or both (Bi-Exporters) in Panel a. In Panel b instead the independent variables represent new traders that only import services (Service Importers), only goods (Goods Importers) or both (Bi-Importers). All regressions include industry-year dummies.

Table 10 Exiters Features

	Panel a: Exports				**Panel b: Imports**			
	Services	Goods			Services	Goods		
		Bi-Exporters				Bi-Importers		
Share of Exiters	41.10%	2.06%		56.84%	33.52%	5.96%		60.52%
Share of Exiters' Exports	23.10%	2.07%	5.69%	69.14%	18.17%	2.45%	8.07%	71.31%
Share of Tot. Exports	0.19%	0.02%	0.05%	0.56%	0.30%	0.04%	0.13%	1.17%
Average Trans. Size	0.0710	0.0755	0.0444	0.0477	0.0773	0.0722	0.0668	0.0494
Average Trans. #	6	5	87	34	2	3	26	7
Average Product #	1	1	3	2	1	1	2	1
Average Destination #	2	2	3	2	1	1	2	1
Average Density	0.9029	0.906	0.7588	0.833	0.9697	0.9404	0.8522	0.9485

Note: this table shows for firms stopping exporting (importing) only services, both services and goods (Bi-Exporters or Bi-Importers) and only goods i) the share of new firms ii) their contribution to exports (imports) of new entrants; iii) their share in overall exports (imports) iv) the average value of the extensive and intensive margins of their flows. Panel a for exports and Panel b for imports.

to entrants is that exiting firms tend to export or import less in their last year of foreign operations.

Having analyzed entry and exit dynamics, the following natural question is related to the survival rates of international firms. Table 12 reports the share of firms that continue operating in foreign markets t years after starting to export/import. Numbers tend to be quite low: only 41% of the new service exporters and importers are still trading after one year and this number falls to a tiny 3% after ten years. Looking at goods side, the same shares are considerably higher: 61% of the new exporters and 66% of the new importers are still present in the foreign markets after one year and 13% of the new exporters and 16% of new importers survive after ten years. Trading services looks like a much riskier activity than trading goods, with a survival probability which is far lower. These numbers raise questions about the factors determining success and failure of firms in international markets. In this context, the prize for the

Table 11 Firm Characteristics of Exiters

	(1) Employment	(2) Turnover	(3) Labor Productivity	(4) Wages	(5) Capital Intensity	(6) Age	(7) Multinational Status	(8) Foreign Ownership
Panel a: Exports								
Bi-Exporters	1.2391***	2.4944***	0.3251***	0.4449***	-0.2045***	0.0254***	0.0572***	0.4169***
	(0.061)	(0.061)	(0.034)	(0.026)	(0.064)	(0.006)	(0.008)	(0.028)
Service Exporters	1.4152***	2.2084***	0.2801***	0.4421***	-0.3765***	0.0225***	0.0431***	0.3355***
	(0.008)	(0.008)	(0.004)	(0.003)	(0.009)	(0.001)	(0.001)	(0.004)
Goods Exporters	1.3200***	2.6133***	0.2938***	0.2816***	0.0197***	0.0233***	0.0411***	0.3596***
	(0.005)	(0.005)	(0.002)	(0.002)	(0.005)	(0.000)	(0.001)	(0.002)
Constant	0.8522***	-1.7283***	-3.0514***	-3.6990***	-3.6642***	0.0018***	0.0031***	2.0772***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.000)	(0.000)	(0.001)
Observations	1,370,986	2,038,349	1,332,929	1,369,421	1,330,812	2,825,190	2,825,190	2,789,924
R-squared	0.1876	0.2569	0.1263	0.1345	0.0876	0.0187	0.0370	0.0761
Panel b: Imports								
Bi-Importers	1.3151***	2.6444***	0.3819***	0.5446***	0.0909	0.0227***	0.0503***	0.3520***
	(0.058)	(0.058)	(0.039)	(0.030)	(0.070)	(0.005)	(0.007)	(0.028)
Service Importers	1.5792***	2.7048***	0.3171***	0.5056***	-0.5066***	0.0370***	0.0748***	0.3782***
	(0.009)	(0.011)	(0.005)	(0.003)	(0.011)	(0.001)	(0.001)	(0.005)
Goods Importers	1.2560***	2.4054***	0.2343***	0.2902***	-0.0163***	0.0103***	0.0207***	0.3909***
	(0.004)	(0.004)	(0.002)	(0.001)	(0.005)	(0.000)	(0.000)	(0.002)
Constant	0.8050***	-1.7727***	-3.0548***	-3.7097***	-3.6634***	0.0016***	0.0025***	2.0684***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.000)	(0.000)	(0.001)
Observations	1,356,414	2,024,524	1,318,537	1,354,849	1,316,329	2,810,250	2,810,250	2,775,097
R-squared	0.1824	0.2577	0.1237	0.1335	0.0880	0.0138	0.0311	0.0769

Note: robust Standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1. Every column represent a different regression in which the dependent variable is one of the seven firm characteristics (Employment, Labor Productivity, Average Wage, Average Capital, Intangible Capital and Age) and the independent variables are the dummies identifying traders stopping exporting only services (Service Exporters), only goods (Goods Exporters) or both (Bi-Exporters) in Panel a. In Panel b instead the independent variables represent traders that stop importing only services (Service Importers), only goods (Goods Importers) or both (Bi-Importers). All regressions include industry-year dummies.

Table 12 Survivors t Years After Starting to Export/Import

	Panel a: Exports			**Panel b: Imports**		
t	Service (%)	Bi-Exporters (%)	Goods (%)	Service (%)	Bi-Importers (%)	Goods (%)
1	100	100	100	100	100	100
2	41	87	61	41	90	66
3	25	77	46	25	80	51
4	16	67	35	17	74	39
5	11	60	29	11	67	33
6	8	54	25	9	63	28
7	6	50	21	7	58	24
8	5	46	18	5	55	21
9	4	42	15	4	52	18
10	3	39	13	3	49	16
11	3	36	11	2	45	14

Note: This table represents the share of firms still active in the export (Panel a) and import (Panel b) after t years with respect to the initial number.

most resilient firms goes to those that trade both goods and services. After one year 87% of exporters and 90% of importers are still active and after ten years numbers stay up to 36% for exporters and 45% for importers. These figures look very high with compared to those of services and goods exporters and they raise a further question related to the direction of the causality link.

4.2 Growth Paths

In Table 13 we look at the firm-level exports and imports and their margins defined in equation (1) during the export and import maturity of the firm, defined as the number of years elapsed since the firm started exporting (Panel

a) or importing (Panel b). In order for numbers to be comparable across time we follow the same cohort of entrants: those who started trading in 1996, for which we have the longest available time span: 10 years.[21] Service exporters start two times smaller than the average service exporter[22] but after ten years they become more than seven times what they were in the first, which means more than three times bigger than the average service exporter. In their first year in foreign markets, goods exporters are also more or less half of the size of the average good exporter. However, after ten years they become less than three times bigger, which means only slightly larger than the average goods exporter. Looking at the import side, the growth of service exporters is still higher than for goods, but the magnitude of the difference is less remarkable. For Bi-Exporters and Bi-Importers is more complicated to delineate a clear pattern: for Bi-Exporters, services grow more than goods, while for Bi-Importers goods grow more than services.

We decompose the firms' growth into the extensive and intensive margin to understand what are the determinants of the above mentioned growth. The usual suspects play only a marginal role. On the one hand, the number of partner countries per firm increases, but at most it doubles and it tends to lie around that of the average exporter or importer in Table 13. On the other hand, firms tend to keep the same number of products per market or to decrease them. So, contrary to what is found in Freund and Pierola (2010) for Peru, the product portfolio growth reveals to be a weak determinant of firm expansion in international markets for both goods and services and for imports and exports. At the same time, transaction values decline up to a quarter what they were in the first year but the transaction number more than compensate for this increasing up to more than seven times. This is in line with Bernard et al (2009) and Buono et al (2008) who find that the main source of goods export growth in the short run is represented by an increases in the average exports per firm, market and product and further qualifies their results in that such increase is crucially determined by a rise in transactions' number.

The key difference between services and goods is that they tend to grow along the transaction number margin slightly more than goods. This is true both across firms (focusing on firms that trade only goods or services) but also within firm (by focusing on Bi-Exporters and Bi-Importers). This important increase in the number of transactions can be the consequence of an increase in the number of interactions with existing customers and/or an increase in the number of customers. Given the magnitudes of the increase and the fact that the transaction values do not tend to rise, the second component is likely to be the most important for our results. This new margin of trade, the "client margin" in the terminology of Carballo et al (2013), is being subject to a very recent interest spurred by the availability of micro trade data allowing to identify the foreign parter like Bernard et al (2013) for Norway and Carballo

[21] In this way, we avoid the exported (imported) values for the first cohort being averaged with those of the later cohorts for which we do not have any meaningful way to correct for inflation.

[22] We refer to the average total firm exports and imports in Table 4.

Table 13 Firms' Trade Margins Over Time: 1996 Cohort of Entrants

	Panel a: Exports				**Panel b: Imports**			
	Services		Goods		Services		Goods	
		Bi-Exporters				Bi-Importers		
t	**Average Exports or Imports**							
1	0.73	0.87	14.69	3.82	1.94	1.05	11.24	2.69
5	4.36	0.86	36.22	10.23	4.77	2.61	47.93	6.97
10	5.56	2.96	41.98	10.36	6.47	1.29	66.95	6.78
10/1	7.57	3.39	2.86	2.72	3.34	1.23	5.96	2.52
	Transaction Size							
1	0.06	0.09	0.05	0.07	0.06	0.07	0.07	0.05
5	0.07	0.02	0.03	0.06	0.06	0.02	0.11	0.04
10	0.04	0.04	0.05	0.06	0.03	0.01	0.02	0.03
10/1	0.60	0.42	1.02	0.91	0.52	0.25	0.29	0.65
	Number of Transactions							
1	5.40	4.82	136.39	37.03	5.84	6.76	169.96	27.48
5	30.18	11.57	409.68	81.36	24.16	13.33	214.50	55.07
10	41.49	30.61	278.04	117.44	39.45	19.13	245.87	54.21
10/1	7.69	6.35	2.04	3.17	6.75	2.83	1.45	1.97
	Number of Products							
1	1.26	1.25	2.57	1.53	1.52	1.52	3.33	1.93
5	1.27	0.71	2.57	1.99	1.72	1.13	4.26	2.65
10	1.40	0.82	1.64	2.10	1.82	1.22	3.93	2.83
10/1	1.11	0.66	0.64	1.37	1.20	0.80	1.18	1.47
	Number of Countries							
1	2.08	1.71	6.86	3.13	2.31	2.20	3.43	2.02
5	3.48	1.75	10.46	4.98	4.39	2.54	5.02	3.08
10	4.35	2.43	9.96	5.62	6.09	3.00	5.07	3.24
10/1	2.09	1.42	1.45	1.80	2.64	1.37	1.47	1.61
	Density							
1	0.95	0.92	0.81	0.90	0.91	0.90	0.75	0.86
5	0.80	0.41	0.67	0.81	0.75	0.46	0.49	0.76
10	0.78	0.45	0.62	0.79	0.73	0.43	0.42	0.74
10/1	0.82	0.49	0.77	0.88	0.80	0.47	0.55	0.86

Note: This table represents the evolution of total firms' export (Panel a) or imports (Panel b) and their margins after 5 and 10 years from the first year in international markets.

et al (2013) for some Latin America countries. Our insight to this small but certainly growing literature is that, to the extent that our increase in the number of transactions is driven more by new clients than by an increase in the interaction with existing ones, the growth of trade in services tends to rely more than that of goods on this channel. Moreover, this result highlights that the expansion of firm exports and imports in a market is likely to be more related to intensification of the interaction with existing market-products (as in Eaton et al (2014)) than to discovering preferences in new markets (as in Araujo et al (2012), Albornoz et al (2012), Buono et al (2008) and Lawless (2009)) and to the introduction of new products within existing partner-countries (as in Freund and Pierola (2010)).

Another important growth channel for firms that start exporting or importing services is represented by the addition of goods to their international portfolio and vice versa. Table 14 shows that service exporters from their second year in the international markets start also exporting goods. These represent 3% of the total exports of the firm, but in ten years they grow more

Table 14 Goods Traders Exporting (Importing) Services and Vice Versa

t	(1) Goods Exp. by Service Exp.		(2) Service Exp. by Goods Exp.		(3) Goods Imp. by Service Imp.		(4) Service Imp. by Goods Imp.	
	Growth	% of Services	Growth	% of Goods	Growth	% of Services	Growth	% of Goods
Average Exports or Imports								
2	1.00	3.17	1.00	0.64	1.00	47.81	1.00	0.25
5	6.08	7.38	1.95	0.84	0.35	9.66	3.34	0.57
10	6.59	6.27	5.69	2.44	9.17	184.13	7.99	1.39
Transaction Size								
2	1.00	13.43	1.00	12.80	1.00	475.81	1.00	7.55
5	0.85	8.54	0.86	12.13	0.02	7.36	0.88	12.33
10	1.23	24.18	0.89	12.82	0.09	75.07	1.28	19.57
Number of Transactions								
2	1.00	5.84	1.00	0.32	1.00	11.43	1.00	0.19
5	8.25	16.28	3.43	0.80	2.91	15.24	4.06	0.69
10	6.51	9.34	11.13	1.81	11.31	36.29	12.16	2.09
Number of Products								
2	1.00	12.97	1.00	4.10	1.00	11.17	1.00	3.17
5	1.42	19.65	1.32	4.74	1.62	17.53	1.56	4.24
10	1.46	18.32	2.26	7.75	1.57	16.02	2.92	7.42
Number of Countries								
2	1.00	7.20	1.00	2.25	1.00	6.19	1.00	2.72
5	2.35	12.90	1.09	3.08	2.33	11.29	1.89	4.23
10	2.77	12.18	1.51	6.73	3.62	12.65	3.74	7.95
Density								
2	1.00	16.70	1.00	7.13	1.00	9.89	1.00	6.71
5	1.16	20.20	1.22	9.19	1.47	15.81	1.38	9.85
10	0.96	17.21	2.10	16.16	1.96	21.63	2.40	17.57

Note: This table represents: i) the evolution of goods' exports and its margins by service exporters (column 1); ii) the evolution of service exports and its margins by goods' exporters (column 2); the evolution of goods' imports and its margins by service importers (column 3); iv) the evolution of service imports and its margins by goods' importers (column 4).

than six times and become more than 6%. Similarly, goods exporters from the second year start adding also services. Initially, they account for 0.64% of total firm exports, but after ten years they grow more than five times achieving 2.44%. For good importers that start importing also services numbers are more or less the same. Instead, for service importers that start importing also goods numbers are a bit more erratic and goods imports can become even more important that services imports. Also in this case, most of the growth is accounted by an increase in the number of transactions, while the transaction size, the number of partner countries and the number of products play only a marginal role. While adding services to goods or goods to services do not represent a large share of total exports and imports for the firm, they can play an important role in determining the success in foreign markets. For example, firms can strategically bundle both of them to decrease the transaction costs for customers. At the same time, the services attached to products might increase the perceived quality of the goods and thus firms might be able to ask for higher prices. Moreover, as we noticed previously, firms that bundle both services and goods in the international markets show higher survival rates and their contribution to total exports and imports is higher than for firms trading only services or goods.

4.3 Considerations on the Dynamic Analysis

The dynamic analysis reveals that trade in services is more active than trade in goods. In particular, we find that both entry and exit rates are higher for service traders than for goods traders. These do not constitute a big surprise, given the sustained growth of trade in services in the past years. However, high exit rates emphasize that the uncertainty in international markets is an important factor for services. Consequently, the share of surviving firms is significantly lower for services. These differences are not related to the characteristics of firms trading goods and those trading services and hold both across and within firms as well as for intra-EU and extra-EU trade. Focusing on the growth strategies of firms, we observe that they tend to growth mostly on the number of transactions they make.[23] Instead, the number of products and the number of destinations grow only marginally and the size of the transaction tends to decline over time. The rapid growth in the number of transactions emphasizes the importance of intensifying the relation of firms with existing country-products either by increasing the number of customers or intensifying the relation with existing ones. Finally, we observe that firms that start exporting or importing services tend to add also goods to their portfolio and vice versa. This is a further growth channel that has never been explored before. It accounts for a non negligible share of trade growth at the firm-level and it might be able to influence the success of firms in international markets.

5 Conclusions

In this paper we have provided a detailed comparison of static and dynamic features of trade in goods and trade in services at the firm level. By using data from the same country, Belgium, and by making use of a common definition of transaction, we have been able to enrich the existing qualitative comparisons with quantitative insights. From a static perspective, we find that firms trading services are fewer and export and import smaller values than those trading goods. This is because they trade fewer products, with less countries, making fewer transactions and these gaps are only partially counterbalanced by larger transaction values. Instead, firms trading both services and goods are even rarer, but they account for a substantial share of total trade. The difference in terms of frequency and size of transactions represents a new indication for models analyzing this choice, such as Hornok and Koren (2015) and Alessandria et al (2010) differentiating across goods and services. In the time dimension, we find that services traders experience higher entry and exit rates and a lower survival probability. However, the surviving firms grow more rapidly than those trading goods thanks to an increase in the number of transactions per product-market. This means that firms grow mostly by intensifying the interaction with existing market-products (as in Eaton et al (2014)) and less by discovering preferences in new markets (as in Araujo et al (2012), Albornoz

[23] This is especially true for service exporters and importers.

et al (2012), Buono et al (2008) and Lawless (2009)) or by introduction of new products within existing partner-countries (as in Freund and Pierola (2010)). Finally, we observe that firms that trade only services add also goods in their export and import basket and vice versa. This is a further growth channel for firms in international markets that has never been considered before.

This paper represents a further advance in the understanding of the differences across goods and services trade and, more generally, of trade characteristics and trade dynamics. However, more research is still needed in order to have a more complete picture of the patterns of trade in services at the firm-level. In particular, this work highlights three critical aspects of trade in services that should deserve more research: i) trade costs, ii) trade modes; iii) the choice of trading services and goods together. The first would shed light on which specific forces hamper services flows. The second would help understanding the dynamics of services that do not require personal interaction versus those that require human proximity. The third would provide evidence on the reasons for such choice and maybe determine the success determinants of firms in foreign markets. The answer to all these questions would provide a more complete understanding of the services sector and services trade, and it would arm policy-makers with new instruments to better master the liberalization of services trade.

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